Economics Information

Ontario

THE COST OF ESTABLISHING A VINEYARD IN ONTARIO

ECONOMICS BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

FOREWORD

In 1980, the Economics Branch of the Ontario Ministry of Agriculture and Food conducted a study to determine the cost of growing grapes in Ontario. When the question of valuing existing vineyards arose, growers and researchers found it difficult to estimate the investment needed to bring a vineyard into production. Accordingly, a method was developed — as described in this report — for budgeting the cost of establishing a vineyard up to its first harvest year.

Costs were worked out by the "consensus" method used in previous studies. A group of knowledgeable and experienced growers and agronomists decided on the type of grapes to be planted, the cultural operations to be performed, and the physical inputs needed to bring the vineyard to bearing age. Each of these factors was then assigned a cost that reflected prevailing prices in each year of operation.

The estimates developed in this study illustrate the budgeting method; they do not necessarily represent the "average" cost of establishing a vineyard in Ontario. Individual growers can, however, adapt the data and change any of the variables in order to calculate costs for their own situation.

ECONOMICS INFORMATION

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METHODS USED IN CALCULATING COSTS

The establishment of a vineyard in Ontario covers a four-and-a-half-year period: a half-year for soil preparation, one year for planting, and three years in which the vines reach bearing age. The vineyard under consideration in this study is part of a commercial grape-growing operation in the Niagara Peninsula. The vineyard is planted in 1977 and is to be harvested for the first time in 1981. The various cost inputs used in the study are summarized below.

LABOR

The vineyard operator is not paid a direct wage; however, it is necessary to include a realistic charge for his time in order to determine the true labor cost. In this study, the hourly rates used for operator labor are $4.00 in 1976, 1977, and 1978; $4.50 in 1979; and $5.00 in 1980.

Hourly rates for hired labor are $2.75 in 1977, $2.85 in 1978, $3.00 in 1979, and $3.25 in 1980.

MACHINERY

It is assumed that a typical line of farm machinery and equipment is used in this enterprise. Basic data on machinery is obtained from previous studies of horticultural crop costs.[1] Hourly rates for each piece of equipment are determined and updated yearly from information in the *Eastern Canada Farm Input Price Index* (Statistics Canada, Cat. No. 62-004). The hourly rates include allowances for depreciation, interest on investment, repairs, maintenance labor, gas, oil, insurance, and housing.

MATERIALS

The type and quantity of materials for fertilizing, planting, posting, and wiring of the new vineyard are decided; and the appropriate price for each year is applied, based on prices obtained from farm supply outlets in the Niagara Peninsula.

OVERHEAD

The Farm Credit Corporation lending rate for new mortgages is used to calculate the interest on investment in land for each year of the study. The interest rate is applied to the agricultural productive value of the land, which is adjusted annually (see Table 1). Taxes, estimated at $10 per acre in 1976, also are adjusted annually according to the *Eastern Canada Farm Input Price Index*.

The cost of tile drainage for this vineyard is estimated at $500 per acre in 1976. This charge is added to the preplanting cost and, like other expenses, amortized over the productive life of the vineyard.

For each year after 1976, interest on the accumulated costs of previous years is calculated at the chartered banks' prime rate plus 1 percent and included in the current year's costs.

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[1] In particular, McKibbon, E.D., "Fruit Production in Ontario, 1974" (Toronto: Economics Branch, Ontario Ministry of Agriculture and Food, December 1975).

Table 1.—Basic Labor and Overhead Costs Applied to Establishment of a Vineyard, 1976-1980

	1976	1977	1978	1979	1980
Hired labor ($ per hour)	..	2.75	2.85	3.00	3.25
Operator labor ($ per hour)	4.00	4.00	4.00	4.50	5.00
Value of land ($ per acre)	1,275	1,350	1,425	1,500	1,575
Interest rate on:					
Investment in land (%)	9.50	8.88	9.38	11.38	12.88
Accumulated costs (%)	..	9.0	10.7	14.0	15.3

VINEYARD ESTABLISHMENT

PREPLANTING YEAR (1976)

In the year before the vineyard is planted, the field is tile drained and worked several times, and 10 tons of manure per acre are spread. As well, a cover crop is sown, and 375 pounds of muriate of potash per acre are applied to the field.

Overhead charges in the preplanting year are calculated for half a year only, on the assumption that a crop was harvested early in the year. The total cost in the preplanting year is estimated at $755 per acre. A breakdown of this figure is given in Table 2.

Table 2.—Costs per Acre for Vineyard in Preplanting Year (1976)

	$/acre
CULTURAL OPERATIONS	
Tile drainage	500
Plow, disc, rotovate & roll (5 hr.)	48
Manure application (3 hr., 10 ton of manure)	90
Cover crop (2 hr., 2 bu. ryegrass)	22
Fertilizing (1 hr., 375 lb. mur. of pot.)	29
Subtotal	689
OVERHEAD (¼-yr. only)	
Interest on investment in land ($1,275 @ 9.50%)	61
Taxes	5
Subtotal	66
TOTAL	755

PLANTING YEAR (1977)

Table 3.—Costs per Acre for Vineyard in Planting Year (1977)

	$/acre
CULTURAL OPERATIONS	
Land preparation (2 hr.)	18
Marking of field (2 hr.)	10
Planting (2 men @ 5 hr. each, 600 vines @ 35¢)	273
Posting & wiring (36 hr., 145 steel posts @ $2.57, 10 end posts @ $1.95, 200 lb. wire @ 33¢, 10 anchors & staples)	717
Weed control (2 hr.)	22
Cultivation (4 hr.)	42
Summer pruning & tying (10 hr.)	37
Cover crop (2 hr., 2 bu. ryegrass, 80 lb. of 10-20-20)	26
Subtotal	1,145
OVERHEAD	
Interest on:	
Investment in land ($1,350 @ 8.88%)	120
Accumulated costs ($755 @ 9.0%)	68
Taxes	11
Subtotal	199
TOTAL	1,344
Accumulated costs at end of planting year	2,099

The land is worked lightly again in the spring, and the field is laid out for planting. Six hundred vines per acre are planted, requiring 10 hours of labor. In this particular vineyard, nongrafted vines are used; if grafted vines were chosen, the planting cost would increase four-fold. A two-wire system is set up to support the vines, using steel posts in the row and wooden posts at the ends. The bottom wire is strung in the planting year and the top wire in the following year. Vines are pruned and tied in the summer.

Weeds are controlled by using a grape hoe; chemical weed killers must not be used in the planting year. The space between rows of vines is kept weed-free by hoeing until late summer, when a cover crop is sown and 80 pounds of fertilizer per acre are applied.

The overhead cost in the planting year includes interest on costs accumulated in the preplanting year (see Table 3). At the end of the planting year, the combined cost of cultural operations and overhead is $1,344 per acre; the accumulated cost for 1976 and 1977 is $2,099.

SECOND YEAR (1978)

Table 4.—Costs per Acre for Vineyard in Second Year (1978)

	$/acre
CULTURAL OPERATIONS	
Replacing vines (5% of vines, 3 hr.)	27
Fertilizing (1 hr., 100 lb. amm. nit.)	20
Pruning (10 hr.)	34
Tying (6 hr.)	21
Second wire (6 hr., 200 lb. wire @ 33¢)	101
Weed control (4 hr.)	28
Cultivation (3 hr.)	34
Summer pruning & tying (10 hr.)	34
Spraying (2 hr., 2 lb. dikar)	31
Cover crop (2 hr., 2 bu. ryegrass, 80 lb. of 10-20-20)	29
Subtotal	359
OVERHEAD	
Interest on:	
Investment in land ($1,425 @ 9.38%)	134
Accumulated costs ($2,099 @ 10.7%)	225
Taxes	11
Subtotal	370
TOTAL	729
Accumulated costs at end of second year	2,828

An estimated 5 percent of the vines need to be replaced in the spring. Also in the spring, and again in the summer, all vines must be pruned and tied. The second wire is added to the support system. For fertilization, 100 pounds of ammonium nitrate per acre are added to the soil. Weeds are controlled by mechanical hoeing and cultivation, and the vines are sprayed with dikar. As in the previous year, a cover crop is planted in late summer, and 80 pounds of fertilizer per acre are applied.

In the second year, operational costs and overhead costs are almost equal (see Table 4). The increase in overhead is largely attributable to the interest charge on accumulated costs to the end of the planting year. Total accumulated costs to the end of the second year are $2,828 per acre.

THIRD YEAR (1979)

Table 5.—Costs per Acre for Vineyard in Third Year (1979)

	$/acre
CULTURAL OPERATIONS	
Replacing vines (4% of vines, 2 hr.)	24
Fertilizing (1 hr., 375 lb. mur. of pot.)	45
Spreading manure (3 hr., 10 ton of manure)	122
Pruning (14 hr.)	52
Tying (6 hr.)	23
Weed spraying (2 hr., 1.5 lb. karmex, 1 qt. gramoxone)	43
Cultivation (3 hr.)	33
Summer pruning & tying (10 hr.)	38
Spraying (3 hr., 3.75 lb. guthion, 15 lb. dikar)	96
Cover crop (2 hr., 2 bu. ryegrass, 80 lb. of 10-20-20)	34
Subtotal	510
OVERHEAD	
Interest on:	
Investment in land ($1,500 @ 11.38%)	171
Accumulated costs ($2,828 @ 14.0%)	396
Taxes	12
Subtotal	579
TOTAL	1,089
Accumulated costs at end of third year	3,917

In the third year, 4 percent of the vines are replaced. Manure and muriate of potash are spread on the surface of the field, in quantities of 10 tons and 375 pounds per acre respectively. Chemical weed control is used along with cultivation. Spring and summer pruning and tying are again required. The vines are sprayed five times using guthion and dikar. A cover crop is planted and fertilizer added, as in previous years.

Overhead costs rise again, through increases in interest charges, particularly on accumulated costs (see Table 5). Total costs in the third year are $1,089, and accumulated costs to date are $3,917 per acre.

FOURTH YEAR (1980)

Table 6.—Costs per Acre for Vineyard in Fourth Year (1980)

	$/acre
CULTURAL OPERATIONS	
Pruning (18 hr.)	74
Tying (8 hr.)	32
Fertilizing (1 hr., 100 lb. of amm. nit.)	27
Cultivation (3 hr.)	44
Weed spraying (2 hr., 2 lb. karmex, 1 qt. gramoxone)	51
Summer pruning & tying (10 hr.)	41
Spraying (3 hr., 3.75 lb. guthion, 15 lb. dikar)	106
Cover crop (2 hr., 2 bu. ryegrass, 80 lb. of 10-20-20)	40
Subtotal	415
OVERHEAD	
Interest on:	
Investment in land ($1,575 @ 12.88%)	203
Accumulated costs ($3,917 @ 15.3%)	599
Taxes	13
Subtotal	815
TOTAL	1,230
TOTAL COST OF ESTABLISHMENT	5,147

Pruning and tying take longer as the vines mature. In the spring, 100 pounds of ammonium nitrate per acre are spread, and the space between rows of vines is kept clear by cultivation. Chemical weed control is used in the rows themselves. The vines are sprayed five times with guthion and dikar. A cover crop is planted in late summer and fertilizer added.

Overhead charges in the fourth year are far greater than operational costs (see Table 6). Again, the main component of overhead is interest on accumulated costs. The total cost in the fourth year is $1,230, bringing the total accumulated cost of establishment to $5,147 per acre.

CONCLUSIONS

The total cost of establishing this new vineyard, estimated at $5,147 per acre, should be charged over the productive life of the grapery. Using the current (April 1981) Farm Credit Corporation interest rate of 14 percent for new mortgages, and amortizing the cost over 20 years, the annual charge to the producing vineyard is $777 per acre. If the cost is amortized over 30 years, the charge per acre is $735. This annual cost applies only to this type of vineyard, planted in 1977 and coming into production in 1981. If different methods of horticultural technology are used or if the years of establishment are different, the total cost of establishment and the annual amortized cost also will vary.

The data in this report can be used directly to calculate a value for recently established vineyards (or portions of vineyards). For older existing vineyards, a slightly different valuation method is needed. The method used by the Economics Branch is based on the premise that existing vineyards will eventually be replaced by the type of vineyard described in this report. Values of existing vineyards are therefore estimated by depreciating the cost of establishment of a new vineyard according to the age and condition of the existing vineyard.

Estimates of the cost of establishment and the value of existing vineyards are used in cost-of-production studies to calculate the total annual costs of producing grapes. This information is useful for farm management purposes. Cost and valuation data do not, however, reflect the sale value of a vineyard. The estimates developed in this study would have to be adjusted to accommodate the market value of the land at the time of sale.

APPENDIX

Appendix Table 1.—Costs per Hectare for Vineyard in Preplanting Year (1976)

	$/ha
CULTURAL OPERATIONS	
Tile drainage	1,236
Plow, disc, rotovate & roll (12.4 hr.)	119
Manure application (7.4 hr., 22.4 tonnes of manure)	222
Cover crop (4.9 hr., 62 kg of ryegrass)	54
Fertilizing (2.5 hr., 420 kg mur. of pot.)	72
Subtotal	1,703
OVERHEAD (½-yr. only)	
Interest on investment in land ($3,151 @ 9.50%)	151
Taxes	12
Subtotal	163
TOTAL	1,866

Appendix Table 2.—Costs per Hectare for Vineyard in Planting Year (1977)

	$/ha
CULTURAL OPERATIONS	
Land preparation (4.9 hr.)	44
Marking of field (4.9 hr.)	25
Planting (2 men @ 12.4 hr., 1,482 vines @ 35¢)	675
Posting & wiring (89 hr., 358 steel posts @ $2.57, 24 end posts @ $1.95, 224 kg wire @ 73¢, 24 anchors & staples)	1,772
Weed control (4.9 hr.)	54
Cultivation (9.9 hr.)	104
Summer pruning & tying (24.7 hr.)	91
Cover crop (4.9 hr., 62 kg of ryegrass, 90 kg of 10-20-20)	64
Subtotal	2,829
OVERHEAD	
Interest on:	
Investment in land ($3,336 @ 8.88%)	296
Accumulated costs ($1,866 @ 9.0%)	168
Taxes	27
Subtotal	491
TOTAL	3,320
Accumulated costs at end of planting year	5,186

Appendix Table 3.—Costs per Hectare for Vineyard in Second Year (1978)

	$/ha
CULTURAL OPERATIONS	
Replacing vines (5% of vines, 7.4 hr.)	67
Fertilizing (2.5 hr., 112 kg amm. nit.)	49
Pruning (24.7 hr.)	84
Tying (14.8 hr.)	52
Second wire (14.8 hr., 224 kg wire @ 73¢)	250
Weed control (9.9 hr.)	69
Cultivation (7.4 hr.)	84
Summer pruning & tying (24.7 hr.)	84
Spraying (4.9 hr., 2.24 kg dikar)	77
Cover crop (4.9 hr., 62 kg of ryegrass, 90 kg of 10-20-20)	72
Subtotal	888
OVERHEAD	
Interest on:	
Investment in land ($3,521 @ 9.38%)	330
Accumulated costs ($5,186 @ 10.7%)	555
Taxes	27
Subtotal	912
TOTAL	1,800
Accumulated costs at end of second year	6,986

Appendix Table 4.—Costs per Hectare for Vineyard in Third Year (1979)

	$/ha
CULTURAL OPERATIONS	
Replacing vines (4% of vines, 4.9 hr.)	59
Fertilizing (2.5 hr., 420 kg mur. of pot.)	111
Spreading manure (7.4 hr., 22.4 tonnes of manure)	301
Pruning (34.6 hr.)	128
Tying (14.8 hr.)	57
Weed spraying (4.9 hr., 1.68 kg karmex, 2.8 L gramoxone)	106
Cultivation (7.4 hr.)	82
Summer pruning & tying (24.7 hr.)	94
Spraying (7.4 hr., 4.2 kg guthion, 16.8 kg dikar)	237
Cover crop (4.9 hr., 62 kg of ryegrass, 90 kg of 10-20-20)	84
Subtotal	1,259
OVERHEAD	
Interest on:	
Investment in land ($3,707 @ 11.38%)	422
Accumulated costs ($6,986 @ 14.0%)	978
Taxes	30
Subtotal	1,430
TOTAL	2,689
Accumulated costs at end of third year	9,675

Appendix Table 5.—Costs per Hectare for Vineyard in Fourth Year (1980)

	$/ha
CULTURAL OPERATIONS	
Pruning (44.5 hr.)	183
Tying (19.8 hr.)	79
Fertilizing (2.5 hr., 112 kg amm. nit.)	67
Cultivation (7.4 hr.)	109
Weed spraying (4.9 hr., 2.24 kg karmex, 2.8 L gramoxone)	126
Summer pruning & tying (24.7 hr.)	101
Spraying (7.4 hr., 4.2 kg guthion, 16.8 kg dikar)	262
Cover crop (4.9 hr., 62 kg of ryegrass, 90 kg 10-20-20)	99
Subtotal	1,026
OVERHEAD	
Interest on:	
Investment in land ($3,892 @ 12.88%)	501
Accumulated costs ($9,675 @ 15.3%)	1,480
Taxes	32
Subtotal	2,013
TOTAL	3,039
TOTAL COST OF ESTABLISHMENT	12,714

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